## REMARKS/ARGUMENTS

Claims 1-30 were pending. The claims have not been amended.

Claims 11-13, 16-20, 26, and 28-30 stand rejected under 35 U.S.C. §101 as being non-statutory subject matter. Claims 1-7, 10-17, 20-23, and 25-30 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent Application Publication No. 2004/0233910 to Chen et al. (hereinafter "Chen") in view of U.S. Patent Application Publication No. 2003/0084241 to Lubbers et al. (hereinafter "Lubbers") and further in view of U.S. Patent No. 6,779,063 to Yamamoto (hereinafter "Yamamoto"). Claims 8, 9, 18, 19, and 24 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Chen in view of Lubbers and further in view of Yamamoto and further view of U.S. Patent No. 5,774,640 to Kurio (hereinafter "Kurio").

**Rejections under 35 U.S.C. §101**

Claims 11-13, 16-20, 26, and 28-30 stand rejected under 35 U.S.C. §101 as being non-statutory subject matter for failing to provide a useful, concrete, and tangible result.

Applicants respectfully submit that independent claims 11, 16, 18 provide a useful, concrete and tangible result by enabling I/O access for a requestor and performing the requested I/O access. Therefore, Applicants submit that claims 11-13, 16-20, 26, and 28-30 are allowable, and request withdrawal of the rejections under 35 U.S.C. § 101.

According to MPEP §2106, when determining whether a claimed invention has satisfied the utility requirement of 35 U.S.C. §101, "focus is not on whether the steps taken to achieve a particular result are useful, tangible, and concrete, but rather on whether the final result achieved by the claimed invention is 'useful, tangible and concrete.'" MPEP §2106.

Applicants submit that the claimed invention produces a useful result. In order for a result to be useful, the result must be (i) specific; (ii) substantial; and (iii) credible. MPEP §2107. Applicants submit that each of the claims recites a specific and substantial result, by enabling I/O access for a requestor and performing I/O access in accordance with requests received from the requestor. Furthermore, according to MPEP §2107, "Credibility is assessed

from the perspective of one of ordinary skill in the art in view of the disclosure and any other evidence of record ... that is probative of the applicant's assertions." MPEP §2107. Applicants submit that one skilled in the art will be able to reproduce the claimed invention based upon the disclosure provided in the specification. Accordingly, Applicants submit that the claimed invention provides a useful result.

Applicants further submit that the claimed invention produces a tangible result. In order for a result to be tangible, the result must be non-abstract. According to MPEP §2106, "[t]he tangible requirement does not necessarily mean that a claim must either be tied to a particular machine or apparatus or must operate to change articles or materials to a different state or thing. However, the tangible requirement does require that the claim must recite more than a 35 U.S.C. 101 judicial exception, in that the process claim must set forth a practical application of that judicial exception to produce a real-world result. MPEP §2106, citing Benson, 409 U.S. at 71-72, 175 USPQ at 676-77 (invention ineligible because had "no substantial practical application."). Applicants submit that the claimed invention sets forth "a practical application ... to produce a real-world result" by providing a method for "controlling a storage device controlling apparatus including a plurality of first channel controllers" in order to process and execute I/O request resulting in data being read from and data being stored to a storage device.

Applicants further submit that the claimed invention produces a concrete result. A result is concrete if "the process must have a result that can be substantially repeatable or the process must substantially produce the same result again. *In re Swartz*, 232 F.3d 862, 864, 56 USPQ2d 1703, 1704 (Fed. Cir. 2000) (where asserted result produced by the claimed invention is "irreproducible" claim should be rejected under section 101)." MPEP §2106. Applicants submit that the claimed methods provide a reproducible result wherein I/O requests are received and processed and wherein file level locking and volume level locking are alternatively applied to control file access depending upon whether one of the plurality of channel controllers receives an I/O request to input/output data in a file stored on a first logical volume.

Accordingly, Applicants submit that that the claimed invention provides a useful, concrete, and tangible result. Therefore, withdrawal of the rejection of independent claims 11, 16, 18, and 20 under 35 U.S.C. §101 is respectfully requested. Furthermore, claims 12, 13, 17-

19, 26, and 28-30 should also be allowable at least due to their dependence from claims 11, 16, 18, and 20, respectively.

**Rejections under 35 U.S.C. §103**

Claims 1-7, 10-17, 20-23, and 25-30

Claims 1-7, 10-17, 20-23, and 25-30 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Chen in view of Lubbers and further in view of Yamamoto.

Applicants submit that Chen, Lubbers, and Yamamoto, either alone or in combination, fail to suggest or disclose each of the features recited in independent claims 1, 4, 6, 10, 11, 14, 16 and 20.

For example, claim 1 recites, in part, a storage device controlling apparatus including a plurality of first channel controllers. Each of the first channel controllers are connected to a LAN and ... [each of the first channel controllers includes] a file processing section for receiving requests to input and output data in files as units sent from at least one information processing apparatus via a network" as recited in claim 1.

The storage device controlling apparatus also includes a "file lock table" for locking of files at the file level and a "logical volume lock table" for locking of files at the block level. If more than one of the plurality of channel controllers receives a plurality of requests to input/output data in a file in the first logical volume, the file is locked with the file lock table in order to provide exclusive access to the file. However, if more than one of the plurality of channel controllers receives a plurality of requests to input/output data in a file in the first logical volume, the data area of the file is locked using the logical volume locking table to provide exclusive access to the file.

Thus, file level or logical volume level locking are alternatively used depending on upon one or more of the plurality of channel controllers receive requests to input/output data in a file on a first logical volume.

Applicants submit that (1) the Office Action has improperly fragmented certain features recited in claim 1 into separate sub-elements, and (2) neither Lubbers nor Chen teach any of these features of claim 1 in their entirety.

Applicants submit that certain features recited in claim 1 should be read in their entirety and not in the piecemeal fashion as suggested by the Office Action. The Office Action fragments the features recited in claim 1 into multiple sub-elements: the Office Action relies upon Lubbers to teach a condition precedent that must be satisfied prior to an action being performed and relies upon Chen to teach the action to be performed if the condition precedent is satisfied. For example, the Office Action relies upon Lubbers for teaching the condition precedent:

> if only one of the first channel controllers receives a plurality of requests to input/output data in a file of the first logical volume and the plurality of first channel controllers shares the first logical volume

recited in claim 1, and then relies upon Chen to teach or suggest the recited action:

> a data area of the file is locked with the use of the file lock table to prohibit an I/O process for the others of the plurality of requests to input/output from being performed while the first channel controller performs an I/O process for one of the plurality of requests to input/output.

Applicants submit, however, that each of the features recited in claim 1 are atomic units, and that the context of the claim element as a whole provides meaning to the various sub-elements. Accordingly, Applicants submit that each of the features recited in claim 1 should be considered as a whole when determining whether the references cited by the Examiner disclose or suggest these features.

Applicants submit that when the features recited in claim 1 are considered as a whole, none of the references cited by the Examiner disclose or suggest each of the elements of these features. For example, Applicants submit that neither Lubbers nor Chen discloses or suggests each of the elements of the following feature recited in claim 1:

> wherein if only one of the first channel controllers receives a plurality of requests to input/output data in a file of the first logical volume and the plurality of first channel controllers shares the first logical volume, a data area of the file is locked with the use of the file lock table to prohibit an I/O process for the others of the plurality of requests to input/output from being performed while the first channel controller performs an I/O process for one of the plurality of requests to input/output.

Applicants submit that neither Lubbers nor Chen teaches each of the elements of this feature in its entirety.

Applicants submit that Lubbers fails to teach "wherein if only one of the first channel controllers receives a plurality of requests to input/output data in a file of the first logical volume and the plurality of first channel controllers shares the first logical volume" as recited in claim 1. The Office Action relies upon paragraphs 0019 and 0054 of Lubbers to disclose or suggest this element of this feature of claim 1. However, the cited portions of Lubbers merely disclose a "memory representation of a LUN" that comprises a mapping structure for mapping a memory request expressed in the logical block units into a read/write request addressed to location on a physical disk. Applicants submit that the cited portion of Lubbers merely discloses mapping a logical address included in an I/O request to a physical address on a physical storage medium. The cited portion of Lubbers is silent as to one of a plurality of channel controllers receiving requests to input/output data to the same file stored in a first logical volume. Accordingly, Applicants submit that Lubbers fails to disclose or suggest at least this element of claim 1.

Furthermore, Applicants submit that Lubbers also fails to teach "a data area of the file is locked with the use of the file lock table to prohibit an I/O process for the others of the plurality of requests to input/output from being performed while the first channel controller performs an I/O process for one of the plurality of requests to input/output" if the condition precedent "if only one of the first channel controllers receives a plurality of requests to input/output data in a file of the first logical volume and the plurality of first channel controllers shares the first logical volume" recited in claim 1 is satisfied. Applicants submit that Lubbers merely provides system and methods for implementing a virtualized storage system and is silent as to providing exclusive access to a file by locking the data area of the file through the use of a file lock table as recited in claim 1. Accordingly, Applicants submit that Lubbers fails to disclose or suggest each of the elements of this feature of claim 1.

Applicants submit that Chen similarly fails disclose or suggest each of the elements of this feature of claim 1. The Office Action admits that Chen fails to teach "if only one of the first channel controllers receives a plurality of requests to input/output data in a file of

the first logical volume and the plurality of first channel controllers shares the first logical volume" as recited in claim 1. Chen also fails to teach at least "a data area of the file is locked with the use of the file lock table to prohibit an I/O process for the others of the plurality of requests to input/output from being performed while the first channel controller performs an I/O process for one of the plurality of requests to input/output" as recited in claim 1. The Office Action relies upon the File Level Access Control Protocol (FLAP) paragraph 0039 of Chen to teach this element of this feature of claim 1. However, the cited section of Chen merely discloses the use of FLAP to permit shared access to files and folders on the file system, and Applicants submit that Chen is silent as to the use of a "file lock table" for controlling access to a file as recited in claim 1. Accordingly, Applicants submit that Chen also fails to disclose or suggest each of the elements of this feature of claim 1.

Applicants further submit that neither Lubbers nor Chen discloses or suggests each of the elements of the following feature recited in claim 1:

> wherein if more than one of the plurality of first channel controllers receive a plurality of requests to input/output data in a file of the first logical volume and the plurality of first channel controllers shares the first logical volume, the data area of the file is locked with the use of the logical volume lock table to prohibit an I/O process for the others of the plurality of requests to input/output from being performed while an I/O process is performed for one of the plurality of requests to input/output

Applicants submit that neither Lubbers nor Chen teaches each of the elements of this feature in its entirety.

Applicants submit that Lubbers fails to teach "if more than one of the plurality of first channel controllers receive a plurality of requests to input/output data in a file of the first logical volume and the plurality of first channel controllers shares the first logical volume" as recited in claim 1. The Office Action relies upon paragraph 0128 of Lubbers to disclose or suggest this element of this feature of claim 1: "In response to user requests, the storage system automatically maps storage between memory representations and on-disk media, levels data storage access across both logical and physical storage structures, and quantifies storage capacity as well as allocation patterns." Lubbers, paragraph 0128. However, the cited portions of Lubbers merely disclose that the system may receive a plurality of user requests for storage, but does not disclose "more than one of the plurality of channel controllers receiving requests to

input/output data in a file of the first logical volume" as recited in claim 1. The cited portion Lubbers fails to disclose a plurality of channel controllers receiving I/O requests and further fails to disclose that the I/O requests are related to the same file in a first logical volume of the storage system as recited in claim 1. Accordingly, Applicants submit that Lubbers fails to disclose or suggest at least this element of claim 1.

Applicants further submit that Lubbers also fails to teach "the data area of the file is locked with the use of the logical volume lock table to prohibit an I/O process for the others of the plurality of requests to input/output from being performed while an I/O process is performed for one of the plurality of requests to input/output" if the condition precedent "if more than one of the plurality of first channel controllers receive a plurality of requests to input/output data in a file of the first logical volume and the plurality of first channel controllers shares the first logical volume" recited in claim 1 is satisfied. Applicants submit that Lubbers merely provides system and methods for implementing a virtualized storage system and is silent as to providing exclusive access to a file by locking the data area of the file through the use of a logical volume lock table as recited in claim 1. Accordingly, Applicants submit that Lubbers fails to disclose or suggest each of the elements of this feature of claim 1.

Applicants submit that Chen similarly fails disclose or suggest each of the elements of this feature of claim 1. The Office Action admits that Chen fails to teach "if more than one of the plurality of first channel controllers receive a plurality of requests to input/output data in a file of the first logical volume and the plurality of first channel controllers shares the first logical volume" as recited in claim 1. Chen also fails to teach at least "the data area of the file is locked with the use of the logical volume lock table to prohibit an I/O process for the others of the plurality of requests to input/output from being performed while an I/O process is performed for one of the plurality of requests to input/output" as recited in claim 1. The Office Action relies upon the Device Level Access Protocol (DLAP) paragraph 0039 of Chen to teach this element of this feature of claim 1. However, the cited section of Chen merely discloses the use of DLAP to permit access to data on a storage device at the block level. Applicants submit that Chen is silent as to the use of a "logical volume lock table" for controlling access to a file as

recited in claim 1. Accordingly, Applicants submit that Chen also fails to disclose or suggest each of the elements of this feature of claim 1.

In addition to relying upon Chen and Lubbers to disclose or suggest each of the features recited in claim 1, the Office Action also relies upon Yamamoto to bolster Chen's alleged teaching of a logical volume lock table as recited in claim 1. Yamamoto discloses a storage system architecture that includes both block and file interfaces for accessing data stored with a storage system. Yamamoto, Abstract. The SCSI interface 26 disclosed in Yamamoto receives block-level read/write requests and locking on data blocks and locking on files (Yamamoto, col. 6, lines 10-15). The Office Action relies upon Yamamoto to teach a "logical file locking table" as recited in independent claim 1. However, Yamamoto merely discloses a "logical volume table" that contains information describing each of a plurality of logical volumes. The logical volume table includes information for mapping the logical volume to a physical storage space. See Yamamoto, col. 7, lines 40-60. Yamamoto is silent as to the logical volume locking table being used to store locking information.

The Office Action cites col. 8, lines 37-40 of Yamamoto as teaching that the logical volume table is used for locking. However, the cited portion of Yamamoto merely discloses that the logical volume table may include information indicating whether a particular logical volume table is accessible to a certain type of access. For example, an entry in the logical volume table for a file system logical volume may indicate that the logical volume was only accessible via file system access and not via block system access. Accordingly, Applicants submit that Yamamoto fails to suggest or disclose a logical volume-lock table for providing exclusive access to a logical volume as recited in claim 1. Instead, Yamamoto merely recites access controls which limit access to a logical volume to certain types of access, but Yamamoto does not disclose or suggest access controls that provide exclusive access to a logical volume, such that provided by the logical volume locking table recited in claim 1.

Accordingly, Applicants submit that even if Chen, Lubbers, and Yamamoto were combined as suggested as in the Office Action, these references fail to disclose or suggest each of the elements of claim 1. Therefore, withdrawal of the rejection of claim 1 is respectfully requested.

Independent claims 4, 6, 10, 11, 14, 16 and 20 and should also be allowable for a similar rationale as claim 1, and others. Furthermore, dependent claims 2, 3, and 21, which depend from claim 1, claims 5 and 22, which depend from claim 4, claims 7 and 23, which depend from claim 6, claims 12, 13, and 26, which depend from claim 11, claims 15 and 27, which depend from claim 14, claims 17 and 28, which depend from claim 16, claim 25, which depends from claim 10, and claim 30, which depends from claim 20, should also be allowable at least due to their dependence from independent claims 1, 4, 6, 10, 11, 14, 16 and 20, respectively.

Claims 8, 9, 18, 19, and 24

Claims 8, 9, 18, 19, and 24 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Chen in view of Lubbers and further in view of Yamamoto and further view of Kurio.

Applicants submit that independent claim 18 and 24 should be allowable for at least the same rationale as independent claim 1, because independent claims 8 and 24 recite limitations that are substantially similar to those recited in independent claim 1. As discussed above, Chen, Lubbers, and Yamamoto, either alone or in combination, fail to disclose or suggest each of the features recited in claim 1. Kurio provides no teaching or suggestion that would remedy this deficiency. Accordingly, Applicants respectfully request the withdrawal of the rejections of claim 8 and 18.

Furthermore, claims 9 and 24, which depend from claim 8, and claims 19 and 29, which depend from claim 18, should also be allowable at least due to their dependence from independent claims 8 and 18 respectively.

## CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,

Dated: July 6, 2007

Jeffrey S. King
Reg. No. 58791

TOWNSEND and TOWNSEND and CREW LLP
Two Embarcadero Center, Eighth Floor
San Francisco, California 94111-3834
Tel: 650-326-2400
Fax: 650-326-2422
JSK:jsk
61059795 v1